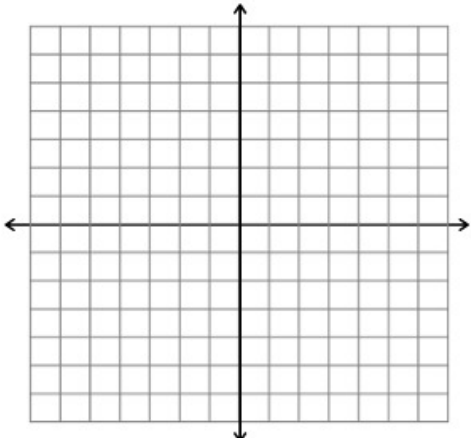
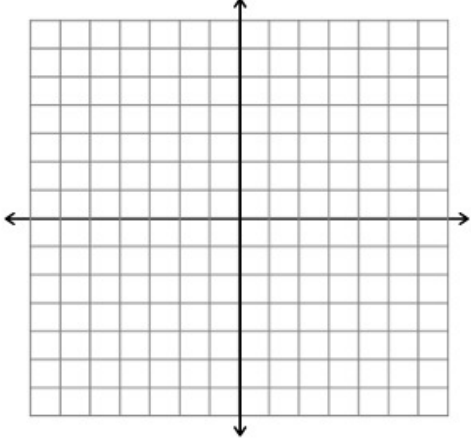


# Rational Functions Investigation

<p><b>1</b></p>	<p>Use the sliders to change the values of <b>H</b> and <b>K</b>. Observe the changes on the graph.</p> <p>Make a sketch of one of your functions:</p> <p><math>f(x)=</math></p> <p>Where is the point <b>(H, K)</b>?</p>	
<p><b>2</b></p>	<p>Now adjust parameter <b>A</b> while <b>H</b> and <b>K</b> stay the same. What do you observe?</p> <p>Explain what happens to the graph as <b>A</b> increases? As <b>A</b> decreases?</p> <p>How does the graph change if <b>A</b> is negative?</p>	
<p><b>3</b></p>	<p>Use the <b>n</b> slider to change the exponent from 1 to 2.</p> <p>Make a sketch of one of your functions.</p> <p><math>f(x)=</math></p> <p>Compare this graph to the graph when the exponent =1. How are they the same and different?</p>	
<p><b>5</b></p>	<p>Experiment with different values for <b>A</b>, <b>H</b>, and <b>K</b>. Notice the changes they cause for the graphs of</p> $f(x) = \frac{a}{(x-h)^1} + k \text{ and } g(x) = \frac{a}{(x-h)^2} + k.$ <p>Explain what each parameter does to the graph:</p> <p><b>A:</b></p> <p><b>H:</b></p> <p><b>K:</b></p>	
<p><b>6</b></p>	<p>What do you think the graph of <math>h(x) = \frac{1}{(x-1)(x+1)}</math> will look like compared with <math>j(x) = \frac{1}{(x-1)^2}</math>?</p> <p>Go to <a href="http://www.geogebra.org/graphing">www.geogebra.org/graphing</a> and try different factors in the denominator. Describe your results.</p>	